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H. R. 4668 . .	12 11 .5	+33 37	5.1 K	—46 to —34	
4 *Draconis* . .	12 25 .7	+69 45	5.2 Ma	—18 to —11	
6 *Draconis* . .	12 30 .5	+70 34	5.2 G5	+ 1 to +13	K
β Muscae . . .	12 40 .1	—67 34	3.3 B3	+ 2 to +68	Chile, 1-pr.
δ Muscae . . .	12 55 .4	—71 01	3.6 K2	+34 to +46	Chile, 3-pr.
36 *Librae* . . .	15 28 .5	—27 42	5.2 K	+10 to +19	Chile, 2-pr.
A. G. C. 22108	16 13 .2	—30 40	5.4 F	—23 to + 1	G2, Chile, 2-pr
H. R. 6455 . .	17 16 .1	+25 37	5.3 A	—10 to + 2	
105 *Herculis* .	18 15 .1	+24 24	5.5 K	—30 to —18	
f *Aquilae* . . .	19 15 .2	— 5 36	5.1 G	—26 to —12	
φ Aquilae . .	19 51 .5	+11 09	5.3 A2	—66 to + 1	
22 *Vulpeculae*	20 11 .2	+23 12	5.4 K	—48 to + 4	G5
35 *Cygni* . . .	20 14 .8	+34 40	5.2 F5	—22 to — 6	
30 *Vulpeculae*	20 40 .6	+24 55	5.1 K	+26 to +33	
α Octantis . .	20 52 .6	—77 24	5.2 F5	+15 to +86	Chile, 2-pr.
c *Capricorni* .	21 39 .6	— 9 32	5.3 K	— 5 to 0	
H. R. 8383 . .	21 53 .8	+63 09	5.4 Ma	—12 to + 5	Bri't H lines
32 *Aquarii* . .	21 59 .7	— 1 24	5.2 A2	+11 to +25	F
μ_1 *Gruis* . . .	22 09 .6	—41 51	4.9 G	—12 to + 1	Chile, 2-pr.
94 *Aquarii* . .	23 13 .8	—14 00	5.3 K	+ 5 to +16	G5
3 *Ceti*	23 59 .4	—11 04	5.2 K	—45 to —34	M6

*Also discovered at the Victoria Observatory.

W. W. CAMPBELL.

May 10, 1922.

THREE PROBABLE SPECTROSCOPIC BINARIES

The absorption lines in the spectra of the following stars change in width, suggesting that the stars are spectroscopic binaries whose components in each case are essentially alike in spectral type and brightness. All of the spectrograms were secured at the Chile Station of the Lick Observatory.

Star	R. A. 1900	Dec.	Vis. mag. spectrum	Remarks
4 *Eridani*	$2^h52^m.9$	—24°16′	5.41 A5	2-pr. and 1-pr.
t *Puppis*	6 54 .7	—33 59	5.07 B5	2-pr.
A. G. C. 9455	7 19 .2	—31 41	5.43 B	1-pr.

W. W. CAMPBELL.

May 15, 1922.

RADIAL VELOCITIES OF CLASS N STARS

Our knowledge concerning the radial velocities of Class N stars is at present very limited, since the complex spectrum of these stars renders such determinations difficult and uncertain on account of the absorption lines being either blends or affected by close emission lines. Especially is this true when low dispersion is employed to which, owing to the feeble photographic light of N stars, we are generally restricted.

Spectrograms of twenty-five Class N stars have been obtained with one-prism dispersion at Mount Hamilton and at the Chile Station in Santiago, and have been measured for radial velocity by a method which would appear to eliminate at least some of the uncertainties due to blends, etc. Several spectrograms of the brightest three N stars, U *Hydræ,* Y *Canum Venaticorum* and 19 *Piscium* were secured with the Mills three-prism spectrograph. These plates were measured on the Hartmann spectrocomparator, using as standard reference plate a spectrogram of a Class M star whose displacement value had been well determined. Although considerable difference exists between N and M spectra in the region 4400 to 4600A, one is able, with care, to pick out many lines which are common to the two, and the measures of these spectrograms are comparable in accuracy with those for Class M stars observed with the Mills spectrograph.

One-prism spectrograms of these three stars were also secured near the date of the Mills observations. Two of these, one of U *Hydræ* and the other of 19 *Piscium,* were used as standard reference plates with which all one-prism plates were measured on the spectrocomparator. The displacement values adopted for the respective standards were those which would make the measures of the one-prism plates of the three stars agree with the Mills observations obtained near the same date. The observational data and the description of the methods of measurement, together with the individual radial velocities of the twenty-five stars are in press as a Lick Observatory Bulletin.

A solution for the elements of the solar motion, based upon the twenty-five radial velocities, gave the position of the apex, R. A. = 225°, Dec. = + 11°, and the velocity of the solar system in space, 17.1 km./sec. After correcting the radial velocities of the individual stars for the component of solar motion, the average velocity of the twenty-five stars of Class N, without regard to sign, is 18.0 km./sec., or 1.5 km./sec. greater than Campbell's value for the average radial velocity of 72 Class M stars. The N stars appear therefore to follow Class M in the progression of average velocity with advancing spectral type.

Proper motions for twenty-three stars of the present list are available from the determinations made by Boss, Norlund and Wilson. From the average τ component of the proper motions combined with the average radial velocity of these stars the mean parallax of the group is found to be $0''.003$. Since the mean apparent magnitude at maximum of the twenty-three stars is 6.1 their mean absolute magnitude is —1.5. This value is in good agreement with that recently obtained by Luplau-Janssen and Haarh from a consideration of the proper-motion data alone, but somewhat smaller than that obtained by Kapteyn[2], —2.6, from the proper motions of 120 N stars.

J. H. MOORE.

NOTE ON THE VARIABLE STAR V 24 = SX HERCULIS (HENRY DRAPER NO. 144921, R. A. $16^h3^m.2$)

Recent spectrograms of this star, which is classified by Harvard as K2, show bright hydrogen lines $H\beta$ $H\gamma$ $H\delta$. A plate obtained by keeping the star stationary in the slit indicates the possibility that the hydrogen image presents a disk, as the image of the $H\gamma$ line is longer than the width of the well-exposed spectrum at that place. A long exposure made with low dispersion reveals no trace of the two chief nebular lines but shows $H\epsilon$ and $H\zeta$ bright and H and K as strong absorption lines. On one of the plates there is a sign of a bright line at 4363 A and possibly also at 4417. The visual magnitude of the star varies between $8^m.0$ and $8^m.8$ in a period of almost 100 days.

May 31, 1922.

W. J. LUYTEN.

NOTES ON THE CROCKER ECLIPSE EXPEDITION TO AUSTRALIA

The first section of the eclipse expedition from the Lick Observatory, in charge of Dr. Robert J. Trumpler, reached the island of Tahiti on April 10th as planned. A letter from Dr. Trumpler states that a splendid observing site was found in the garden of an American resident, with valued advantages or work rooms and other conveniences immediately at hand.

The Einstein camera of the Toronto University is scheduled to reach Tahiti the middle of May, in order that Dr. Trumpler may mount it on the Einstein polar axis of the Crocker expedition and secure the photographs of the critical eclipse group of stars, for comparison with photographs secured at Wallal on the northwest coast of Australia during the total phase of the eclipse. Professor Chant has been unable to accompany his instrument, owing to engagements which keep him at Toronto until June.

The Navy Department of Australia has found that a naval vessel for the transport of the Lick Observatory, the Univer-

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[1] *Astr, Nach.*, **214**, 383, 1921.
[2] *Astroph. Jour.*, **32**, 9, 1910.